Editorial

Degenerate and Singular Differential Operators with Applications to Boundary Value Problems

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In the last years a lot of papers involving degenerate and singular partial differential equations have been published in important journals of the world. This class of differential equations has received all this attention, because it arises in the study of linear or nonlinear processes, including, for example, singular solutions of stationary or evolutionary equations, concentration of singularities in nonlinear PDEs, and Lane-Emden-Fowler-type equations with convection and singular potential. We would like to thank the authors for their excellent contributions and patience in assisting us. Finally, the fundamental work of all reviewers on these papers is also very warmly acknowledged.

This special issue contains eight papers, of which five papers are related to ordinary differential equations, two papers involve parabolic equations, and one paper is concerned with properties involving a hight-order differential operator. In some of the papers, the reader can find problems involving the Sturm-Liouville differential equation, as well as some articles involving singular nonlinearities.

In the first paper, "*On the time periodic free boundary associated to some nonlinear parabolic equations,*" M. Badii and J. I. Daz prove some qualitative properties of the time periodic free boundary generated by the solution of a general class of second-order quasilinear equations, which, include for example, the p-Laplacian operator.

In the second paper entitled, "*Multiple positive solutions of the singular boundary value problem for second order impulsive differential equations on the half-line,*" J. Xiao, J. J. Nieto, and Z. G. Luo study the existence of multiple solutions for a second order impulsive singular differential equations on the half-line by using fixed-point theorem in cones.

In the third paper, "*Comparison between the variational iteration method and the homotopy perturbation method for the Sturm-Liouville differential equation*," A. Neamaty and R. Darzi use the variational iteration method together with the homotopy perturbation method to solve Sturm-Liouville eigenvalue and boundary value problems, since these methods give approximate and exact solution for this class of problem.

In the fourth paper, "*Quenching for a reaction-diffusion system with coupled inner singular absorption terms*," S. Zhou and C. Mu show that the existence of solution in finite time for all initial data is obtained, and the blowup of time derivatives at the quenching point is verified.

In the fifth paper, "*The boundary value problem of the equations with nonnegative characteristic form*," L. Li and M. Tian have considered the generalized Keldys-Fichera boundary value problem for a class of higher-order equations with nonnegative characteristic, where the main tools used were the acute angle principle together with Hölder and Young inequalities.

In the sixth paper entitled, "*Existence of positive solutions of a singular nonlinear boundary value problem*," R. Ma and J. Li have showed the existence for a singular ordinary differential equation by using topological degree and global bifurcation theorem due to Rabinowitz.

In the seventh paper, "*Positive solutions for fourth-order singular p-Laplacian differential equations with integral boundary conditions*," X. Zhang and Y. Cui have used the upper and lower solutions method to prove the existence of positive solution for an E.D.O. involving a fourth order differential operator with a nonlocal boundary condition.

In the eighth paper, "*Unbounded solutions of second-order multi-point boundary value problem on the half-line*," L. Liu, X. Hao, and Y. Wu have investigated the existence of solutions for a class of multi-point value problem. Here, the main tools are fixed point index theory and Banach contraction mapping principle.

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